

June 9, 2021

Mr. Ricky Vargas
Project Manager
Land and Redevelopment Programs Branch
Land, Chemicals and Redevelopment Division
United States Environmental Protection Agency, Region 2
290 Broadway, 25th Floor
New York, New York 10007

Re: Response to USEPA Comments dated February 22, 2021
Justification for No Further Investigation for Groundwater
Potential Area of Concern 6
Former Chevron Perth Amboy Facility, Perth Amboy, New Jersey
EPA ID No. NJD081982902
SRP PI # 003621

Dear Mr. Vargas,

Parsons, on behalf of Chevron, has prepared this letter in response to United States Environmental Protection Agency (USEPA) comments provided to Chevron in an email dated March 11, 2021, regarding Chevron's Justification for No Further Investigation for Groundwater – Potential Area of Concern (PAOC) 6. The comments provided by USEPA focused on the delineation of light non-aqueous phase liquids (LNAPL) identified in the PAOC 6 subsurface and evaluation of potential soil and groundwater impacts associated with LNAPL. The following discussion presents additional information necessary for the evaluation of LNAPL and associated soil and groundwater impacts in PAOC 6 and to address USEPA comments.

PAOC 6 BACKGROUND INFORMATION

The area designated as PAOC 6 was initially identified as a potential area of concern that required investigation to assess potential environmental impacts under the New Jersey Department of Environmental Protection (NJDEP) Industrial Site Reclamation Act (ISRA) program. Between June 1996 and August 2013, several ISRA soil investigations were performed in PAOC 6. These ISRA soil investigations involved the collection of soil samples for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and Target Analyte List (TAL) metals. Selected subsurface soil samples were also analyzed for total organic carbon (TOC) and extractable petroleum hydrocarbons (EPH). The 2013 soil boring locations were biased toward valves, connection points, and areas with visual evidence of impact as identified on aerial photography. Laboratory analytical results showed that VOCs were not detected in soil at concentrations greater than the NJDEP Nonresidential Direct Contact Soil Remediation Standards (NRDCSRS). The polycyclic aromatic hydrocarbons (PAHs) benzo(a)pyrene (BaP) and dibenz(a,h)anthracene were detected in soil at concentrations slightly above the NJDEP NRDCSRS. Lead was detected in one surface soil sample (soil boring S3879) at a concentration greater than the NJDEP NRDCSRS.

Concentrations of Corrective Measures Implementation (CMI) primary constituents of concern (PCOCs) detected during the PAOC investigation were compared to the CMI action levels. Benzene and benzo(a)pyrene, although detected at concentrations above the NJDEP NRDCSRS, were not detected in soil at concentrations greater than the CMI action levels (13 mg/kg for benzene and 10 mg/kg for BaP),

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therefore, addressing these PCOCs under the CMI was not warranted. Lead was detected in soil at concentrations above the NJDEP NRDCSRS and CMI action level of 800 mg/kg. Since lead was detected in soil above the CMI action level, lead-impacted in soil in PAOC 6 was addressed under the CMI.

Additional soil investigation activities were performed under the RCRA CMI from May through August 2015 to define the extent of lead-impacted soil identified during previous investigations completed within PAOC 6. The additional soil investigation activities involved the advancement of 30 soil borings to delineate lead impacts identified in soil boring S3879. Soil cores were screened using a hand-held portable x-ray fluorescence (XRF) unit and soil samples were collected for lead analysis. Based on the field XRF screening, soil samples were collected between 0.0 and 4.5 feet bgs. Lead was detected above the Corrective Measures Implementation (CMI) action level and NRDCSRS at concentrations ranging from 828 to 184,000 mg/kg in 22 of the 30 soil borings at depths ranging between 0.0 and 2.75 feet bgs. Based on the concentrations of lead detected in PAOC 6 soil, Chevron elected to address the lead-impacted soil identified in PAOC 6 under the CMI. The Ex Situ Stabilization (ESS) CMI was completed to address lead impacts in PAOC 6 soil. The successful remediation of lead-impacted soil in PAOC 6 was documented in a construction completion report (CCR) that was submitted to and subsequently approved by USEPA.

Groundwater sampling for Skinner's List VOCs, Skinner's List SVOCs, and lead was conducted at temporary well location HP-0121 in September 1997. Hydropunch locations H1102, H1145, H1169, H1397, and H1398 were sampled for TCL VOCs in July and August 2013. Groundwater samples collected from temporary wells showed exceedances of the NJDEP Ground Water Quality Standards (GWQS) for benzene and total xylenes. Benzene was not detected at concentrations above the CMI action level in groundwater samples collected from the TWPs and HPs in the PAOC 6 area; therefore, investigation and remediation of benzene in groundwater was not required under the CMI.

LNAPL was not historically identified in the temporary well point (TWPs) or hydropunch (HP) samples collected from the PAOC 6 area to evaluate potential groundwater impacts. Since LNAPL was not identified in groundwater samples collected during previous investigations, the PAOC 6 area was not identified as an LNAPL area to be investigated under the CMI.

LNAPL IN PAOC 6 SUBSURFACE

USEPA provided revised comments dated February 22, 2021, to Chevron pertaining to LNAPL in the PAOC 6 subsurface. The main concern expressed by NJDEP and USEPA is the delineation of LNAPL in the subsurface in the PAOC 6 area. The comment letter listed several soil borings where LNAPL, sheen, or high PID readings were observed in the subsurface. USEPA and NJDEP note in the comment letter that the soil excavation performed as part of ESS CMI in the PAOC 6 area focused on the remediation of lead impacts in the subsurface and the soil excavation did not completely address LNAPL impacted soil identified in the area. Further, USEPA and NJDEP commented that the soil borings advanced to evaluate lead impacts in PAOC 6 did not define or delineate the vertical extent of LNAPL, sheen, or high PID readings observed in the subsurface.

The majority of the soil borings within the PAOC 6 area were advanced and sampled to evaluate lead impacts in soil for the ESS CMI. The soil borings are relatively shallow (3 to 5 feet deep) and did not extend through the fill material into the underlying native peat/organic silt layer. Boring logs were reviewed, and cross-sections were developed to provide a visual depiction of impacted intervals (LNAPL, residual LNAPL, sheen, hydrocarbon staining, hydrocarbon odors, and elevated PID readings) with respect to subsurface stratigraphy across the PAOC 6 area (which includes the adjacent SWMU 19 area). Information presented on soil borings logs proved to be sufficient to define the horizontal and vertical extents of LNAPL within the PAOC 6 area subsurface.



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Soil borings where LNAPL was identified cover a relatively large area; however, LNAPL does not appear to be a continuous layer floating on the groundwater table. Rather, the LNAPL appears to be located in discontinuous "pockets" bound to the soil and does not appear to be migrating with groundwater. As discussed previously, LNAPL was not observed in TWPs installed in the PAOC 6 area indicating the LNAPL does not migrate through the subsurface and is therefore not recoverable. The soil boring locations and the horizontal extent of LNAPL are depicted on Figure 1. Figure 2 depicts soil boring locations, horizontal extent of LNAPL, and ESS CMI areas. Cross section lines and soil boring locations are depicted on Figure 3.

Cross-sections (included in Attachment A) were developed to depict the subsurface stratigraphy, presence of LNAPL, sheens, hydrocarbon staining, hydrocarbon odors, and high PID readings observed in soil borings located within the defined horizontal extent of LNAPL in the PAOC 6 area. The cross-sections indicate LNAPL and associated impacts within the defined LNAPL area are limited to the fill material overlying the native peat/organic silt layer. The depth to the top of the native peat/organic silt layer varies across the area; however, the native peat/organic silt layer appears to be laterally continuous. LNAPL, sheens, or significant hydrocarbon odors and staining were not observed in the native peat/organic silt underlying the fill material. This indicates the impacts observed in the fill material do not extend below the native peat/organic silt layer, thus defining the vertical extent of LNAPL impacts in the PAOC 6 area. The identification of the native peat/organic silt layer defining vertical extent of LNAPL impacts in the PAOC 6 area is consistent with the vertical delineation of impacts identified in the fill material across the Facility.

The comments provided by USEPA/NJDEP identified several specific soil borings in the PAOC 6 and adjacent SWMU 19 areas where LNAPL, a sheen, and/or high PID readings were observed and noted on the associated soil boring log. The specific borings noted by NJDEP and a discussion of the vertical delineation of LNAPL-related impacts at that location is provided below.

Soil borings S1384, S0774, S2443, S2136, S2207, SB-0208, and SB-0211 are located within and to the west of the SWMU 19 ESS CMI excavation area (SWMU 19 Area B) as depicted on Figure 2. Cross-sections A-A' and E-E' transect this area and soil borings S1384, S0774, S2443, S2136, S2207, SB-0208, and SB-0211 are depicted on these cross-sections (Attachment A). Soil borings in this area extended from the ground surface, through the fill material layer, into the underlying native peat/organic silt layer. LNAPL, hydrocarbon odors, hydrocarbon staining, sheens, and high PID readings were observed in the fill material as shown on cross-sections A-A' and E-E'. The cross sections also show that LNAPL, sheens, hydrocarbon odors, hydrocarbon staining, and high PID readings were not observed in the underlying native peat/organic silt layer. LNAPL and LNAPL-associated impacts identified at borings S1384, S0774, S2443, S2136, S2207, SB-0208, and SB-0211 are limited to the fill material and the underlying native peat/organic silt layer provides the vertical delineation of LNAPL and LNAPL-associated impacts observed in the fill material.

Soil borings S5291, S5231, S4867, S4868, S5297, and S5314 are located within PAOC 6 as shown on Figure 2. These soil borings are depicted on cross section F-F' that transects the area (Attachment A). Soil borings in this area are relatively shallow; however, with the exception of soil boring S4868, the borings extend through the fill material and into the underlying native peat/organic silt layer. Cross section F-F' shows that LNAPL, sheens, hydrocarbon odors, hydrocarbon staining, and high PID readings were observed in the fill material; however, these impacts were not observed in the underlying native peat/organic silt. The native peat/organic silt layer provides vertical delineation of LNAPL and LNAPL-associated impacts observed in the overlying fill material.

Soil borings S5298 and S5313 are located in PAOC 6 excavation Area E (Figure 2) and are depicted on cross section A-A' (Attachment A). LNAPL and a sheen were observed in the fill material at soil boring S5298. Organic silt was encountered at approximately 3 feet bgs and is described as exhibiting a sheen



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with hydrocarbon odors and high PID readings. Soil boring S5313 was advanced to the top of the native organic silt layer. High PID readings and hydrocarbon odors were observed in the fill material and at the top of the native organic silt layer. Since these borings did not extend into the native peat/organic silt layer and representative core samples of undisturbed native material are not available, surrounding soil borings were used to evaluate vertical delineation of the LNAPL and LNAPL-associated impacts identified in soil borings S5298 and S5313. Soil borings S5297, S4867, S5231, and S5291 are located west of S5298 and S5313 (Figure 2). These soil borings are depicted on cross-section F-F' (Attachment A) and show that LNAPL and LNAPL-associated impacts are limited to the fill material and the underlying native peat/organic silt layer defines the vertical extent of impacted fill material.

Soil borings S5292, S4722, S4729, S4734, S4736, S5294, S4730, S5293, S5295, and S5296 are located on the northwest side of Tank 326 (Figure 2). These soil borings appear on multiple cross sections that traverse the area (see cross sections B-B', C-C', D-D', and F-F'). Cross sections B-B', C-C', D-D', and F-F' (Attachment A), show that with the exception of soil boring S5293, the soil borings in this area of PAOC 6 are all relatively shallow (between 3 to 5 feet bgs) and do not extend deep enough to encounter the native peat/organic silt layer. Hydrocarbon odors and high PID readings were observed in the fill material at S5293; however, no hydrocarbon odors or high PID readings were observed in the underlying native peat/organic silt layer at this location. Since the majority of the soil borings listed above are shallow and do not extend into the native peat/organic silt layer, representative soil borings in the immediate area were evaluated to demonstrate vertical delineation of LNAPL and LNAPL-associated impacts observed in the fill material. Soil boring S3281/H1169 is located approximately 10 feet west of S5292. Soil boring S3281/H1169 was advanced to 8 feet bgs, approximately two feet into the underlying native peat layer. As shown on cross section D-D', no odors, staining, LNAPL, or sheens were observed in the native peat layer. Consistent with other areas within PAOC 6 and across the Facility, LNAPL and LNAPL-associated impacts are limited to the fill material overlying the native peat/organic silt layer.

Soil boring S1012 is located to the west of PAOC 6 (Figure 2). Cross sections C-C' and E-E' (Attachment A) present stratigraphic information for soil boring S1012. These cross sections show that catalyst beads, sheens, and hydrocarbon odors were observed in the fill material. Native peat was encountered at approximately 11.5 feet bgs. As described on the soil boring logs and depicted on cross sections C-C' and E-E', hydrocarbon odors, hydrocarbon staining, and LNAPL were not observed in the native peat layer, thus completing the vertical delineation of impacts identified in the fill material at soil boring S1012.

CORRELATION OF BENZENE AND HIGH PID READINGS

Although the majority of soil and groundwater sampling performed in the PAOC 6 area focused on lead impacts, review of available analytical data shows that soil and groundwater samples were collected from the area for volatile organic compound (VOC) analysis. Figure 4 presents the defined extent of LNAPL in the PAOC 6 area along with benzene results in soil. Figure 5 presents the defined extent of LNAPL in the PAOC 6 area along with benzene results in groundwater. The data presented on Figures 4 and 5 demonstrate benzene was not identified at concentrations above CMI action levels in soil or groundwater in the PAOC 6 area. Since benzene was not detected at concentrations above the CMI action level in PAOC 6 soil or groundwater, investigation and remediation of benzene in PAOC 6 soil and groundwater was not required under the CMI.

CONCLUSIONS

Boring logs and analytical data available for the PAOC 6 area were reviewed to evaluate the presence and extent of LNAPL and associated impacts in the subsurface. Information presented on the boring logs was used to develop cross sections to depict subsurface conditions across the PAOC 6 area. The boring logs and cross sections demonstrate LNAPL and associated impacts are limited to the fill material and are vertically defined by the underlying, laterally continuous native peat/organic silt layer. Existing soil and



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groundwater analytical results indicate benzene is not present in soil or groundwater at concentrations above CMI action levels; therefore, implementation of the ISCO CMI in PAOC 6 was not warranted. Based on the information presented herein, Chevron requests USEPA and NJDEP approve the proposal for No Further Investigation of LNAPL and benzene impacts in soil and groundwater in the PAOC 6 area of the Facility's Main Yard.

Should you require any additional information, please contact me directly at (732) 738-2226.

Sincerely,

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Todd Frantz Senior Project Manager Parsons

Attachment A: Cross Sections

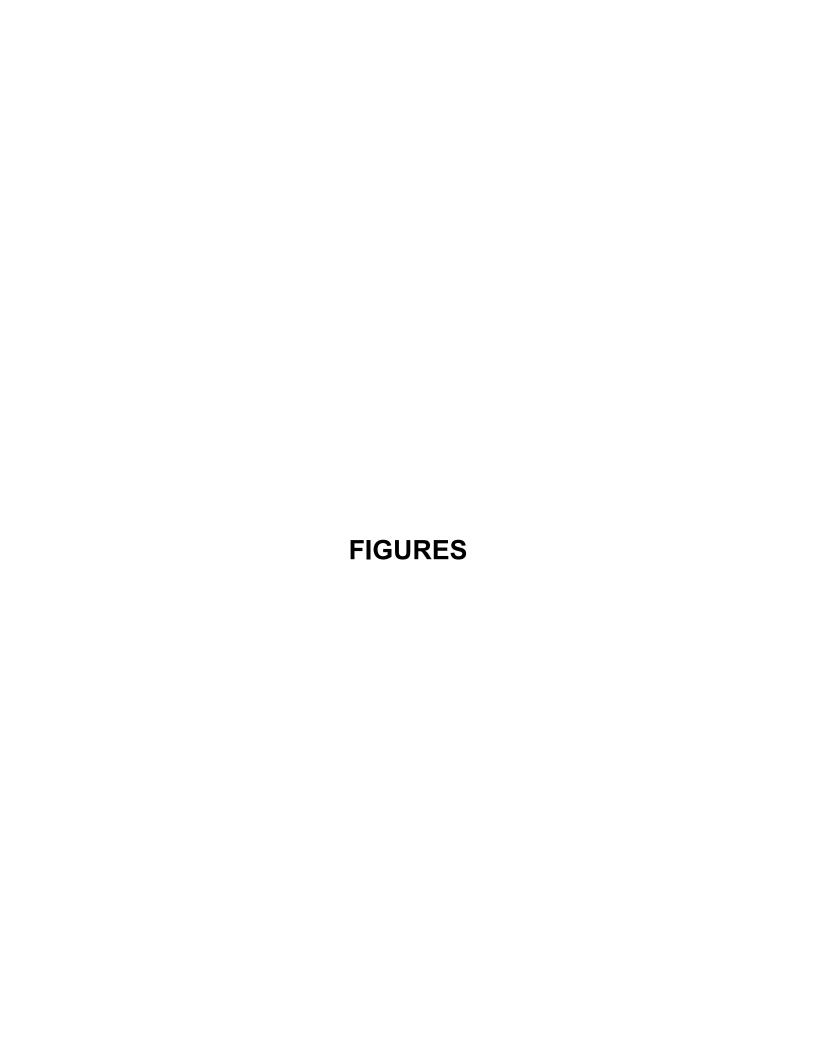
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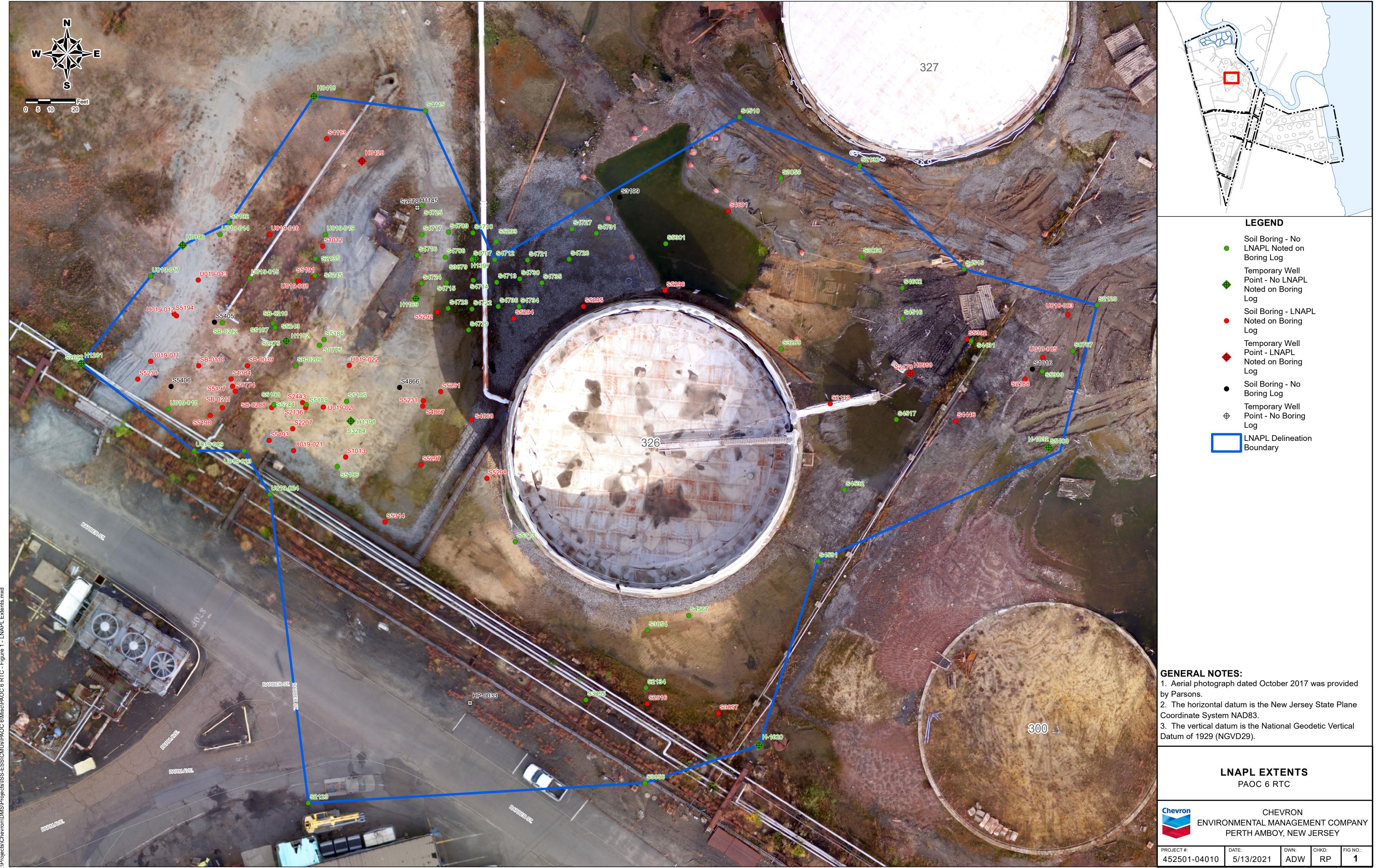
Mr. Charlie Zielinski, NJDEP

Mr. Mike Samuel, Buckeye Perth Amboy Terminal, LLC Ms. Krista Manley, Buckeye Perth Amboy Terminal, LLC

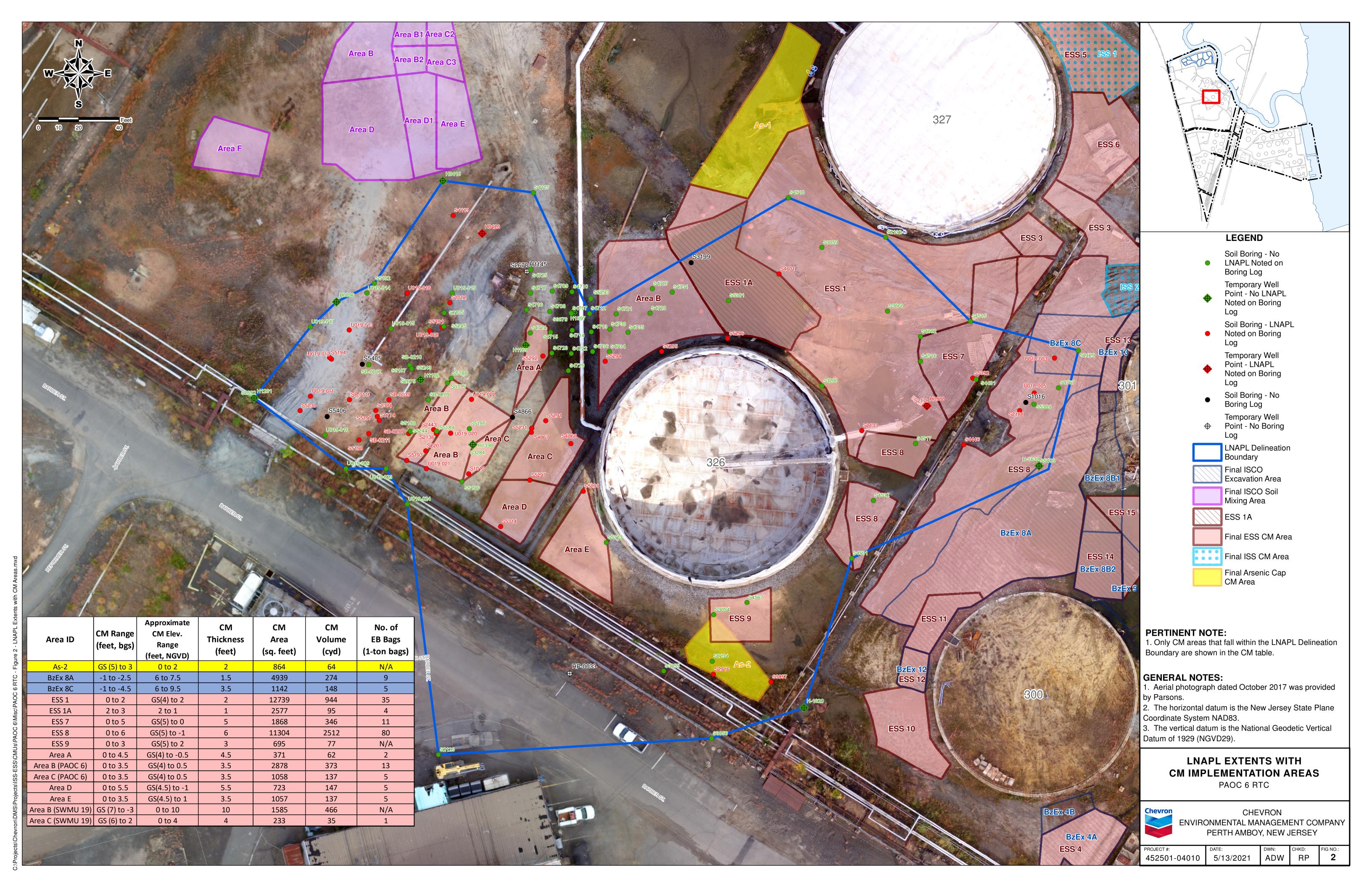
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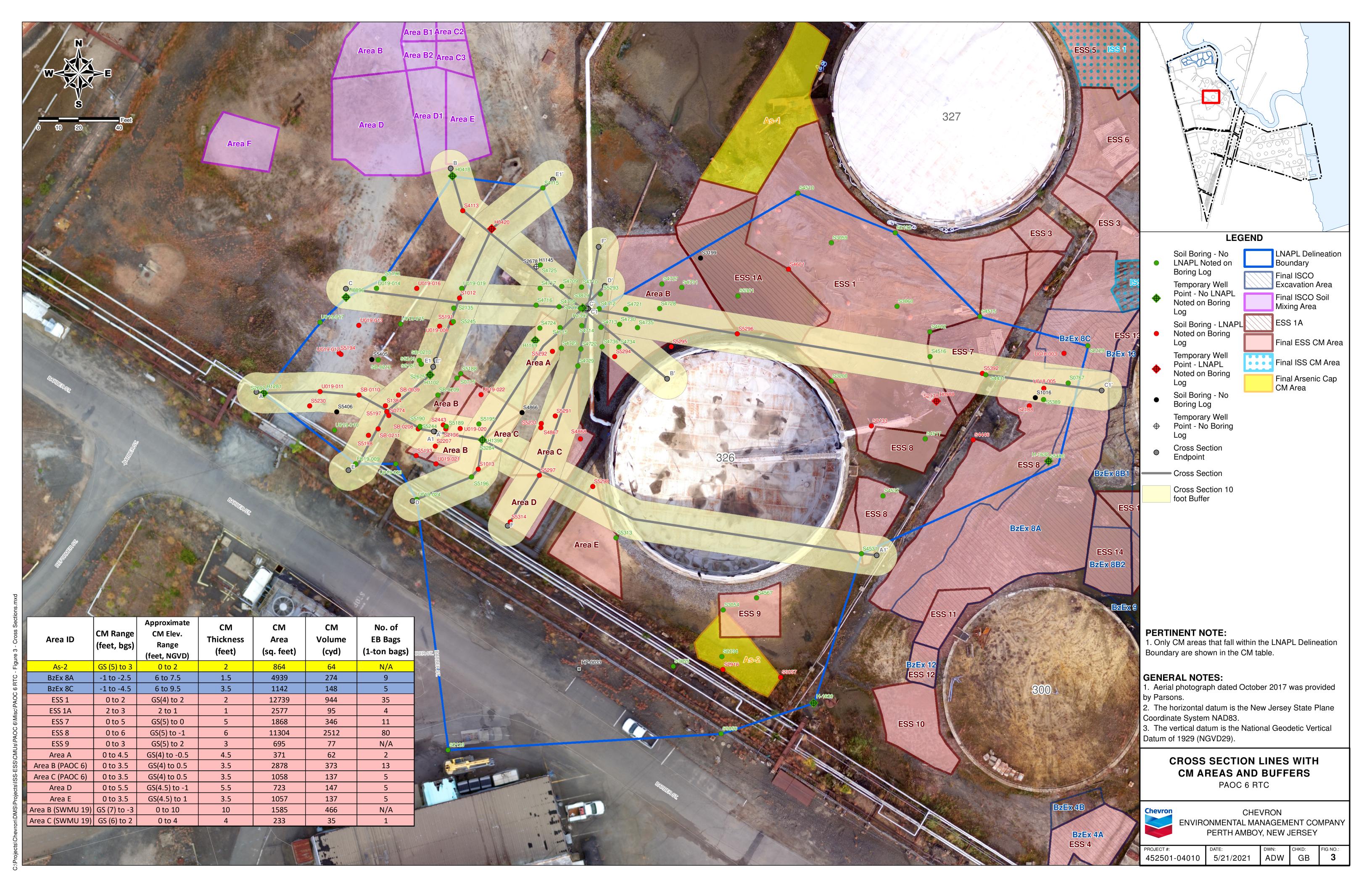


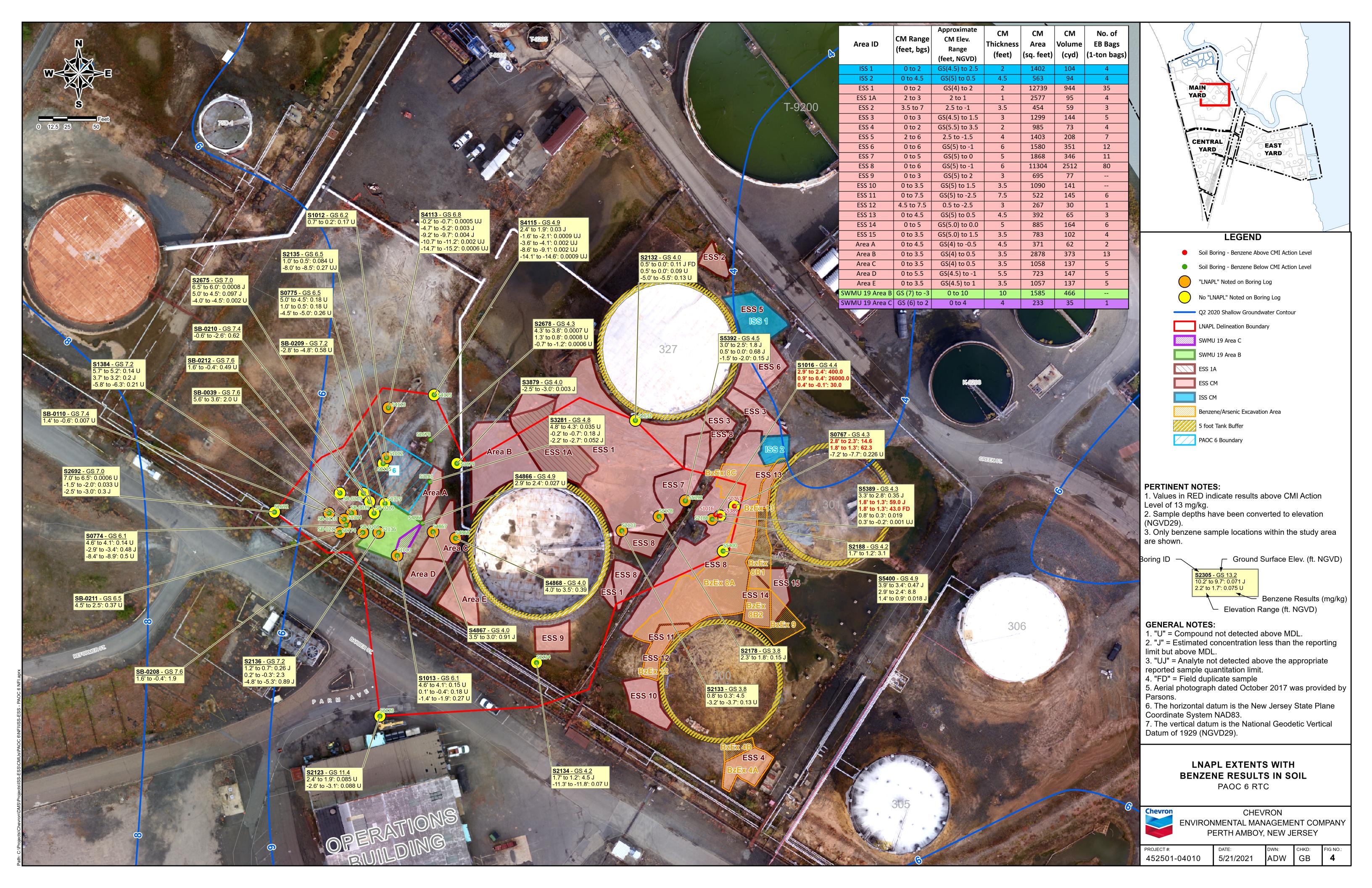


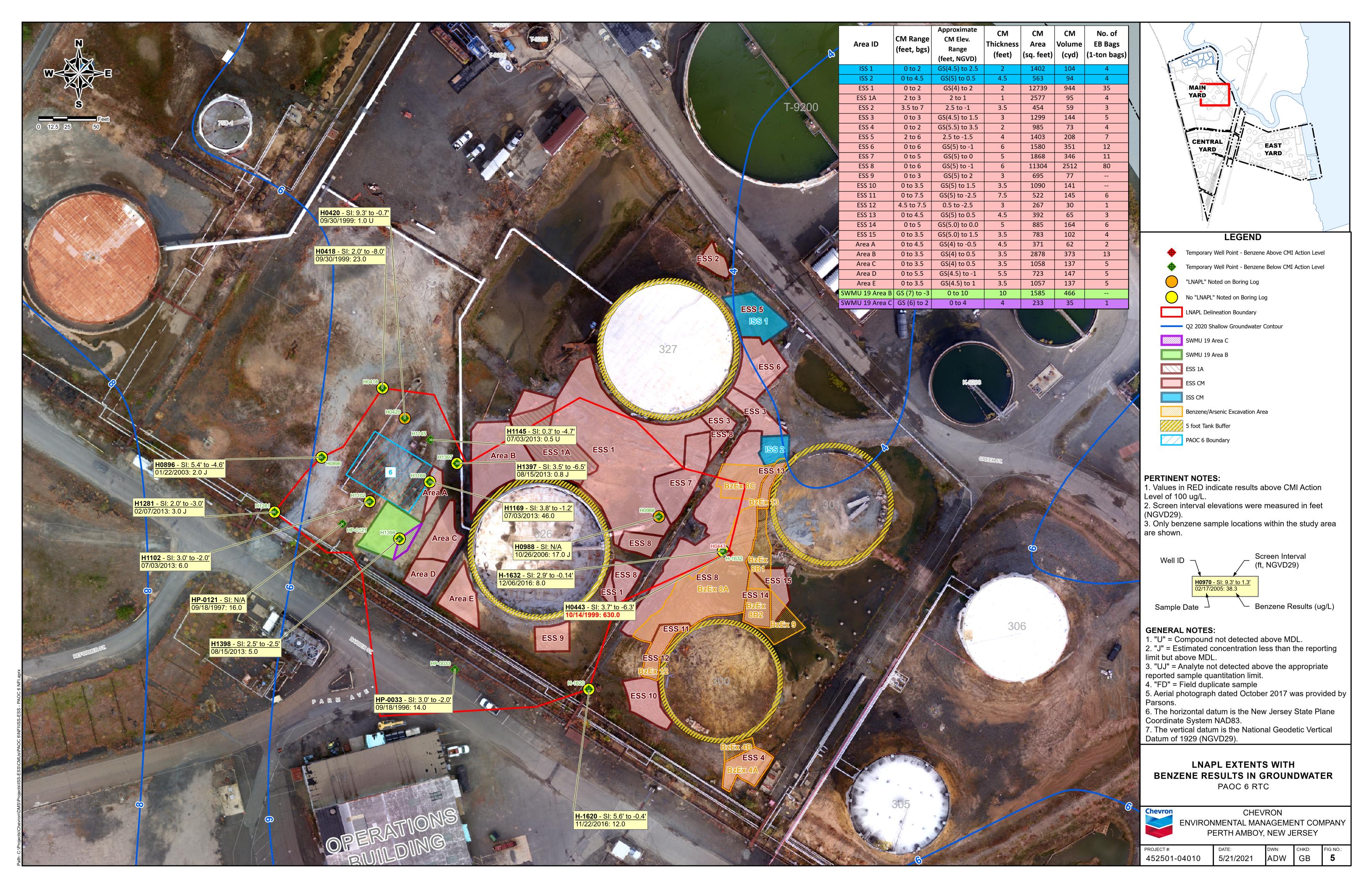


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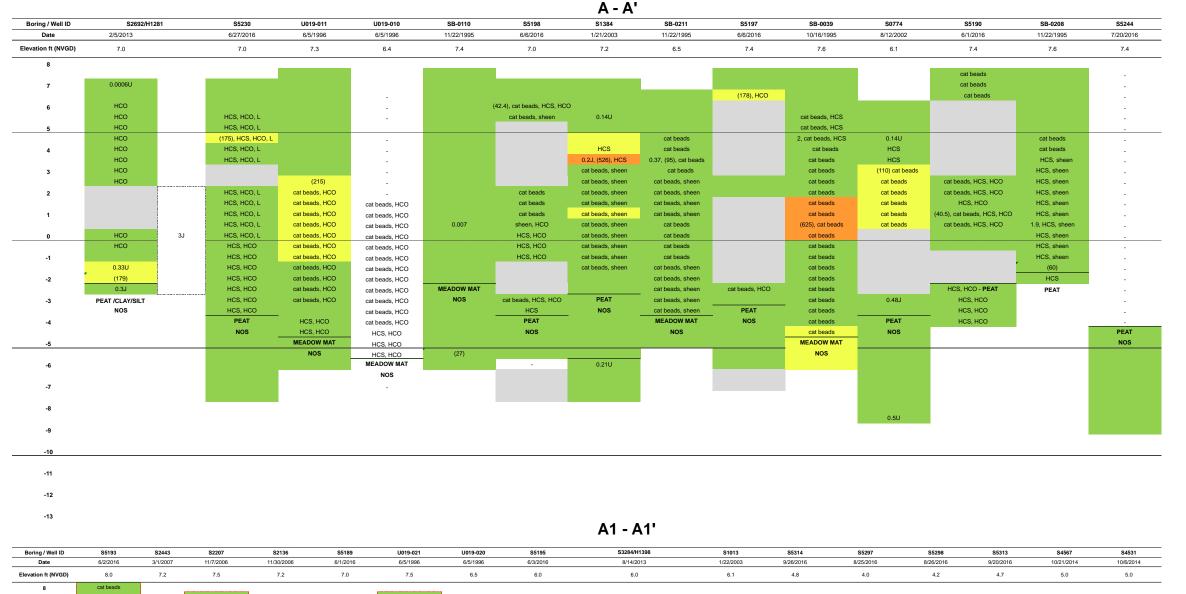


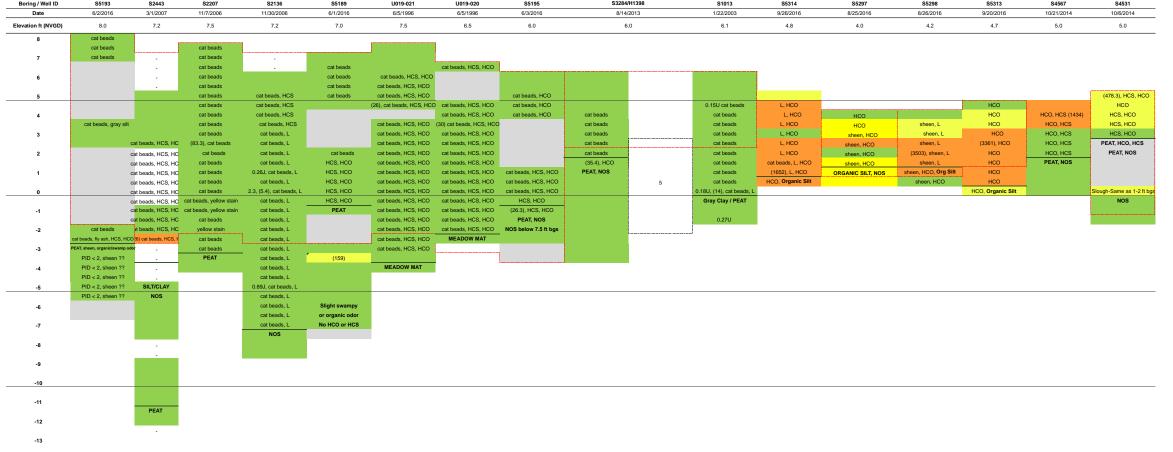




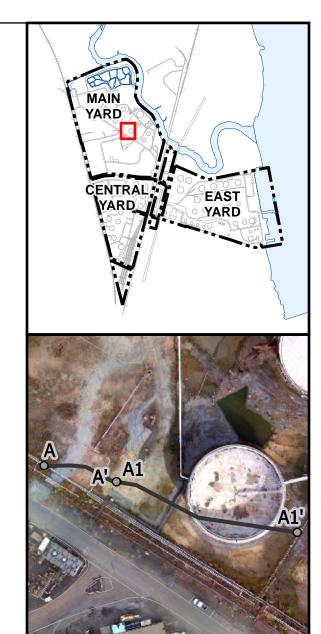


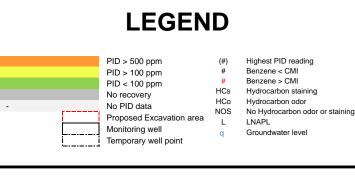
ATTACHMENT A PAOC 6 AREA CROSS SECTIONS





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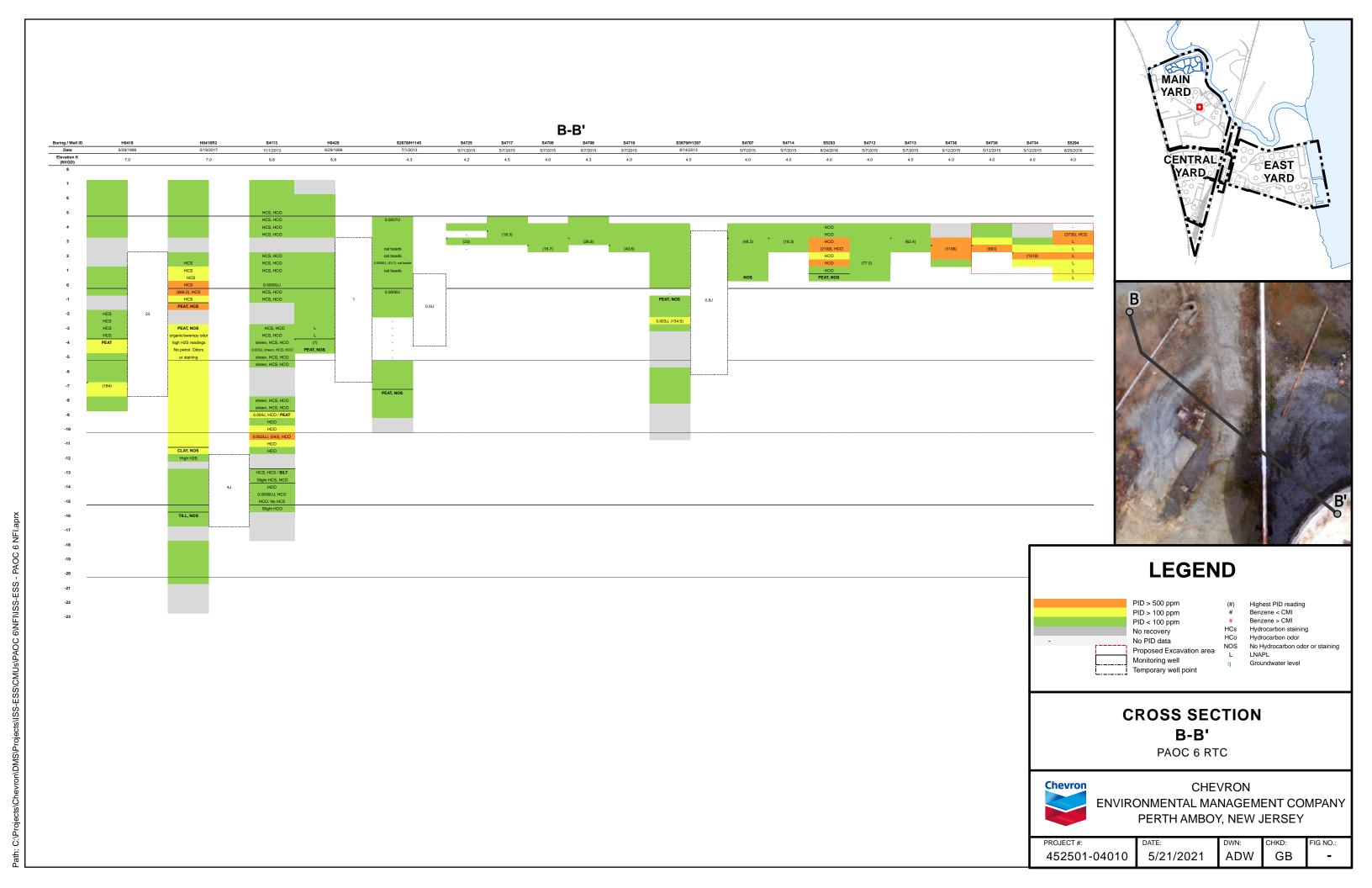
CROSS SECTION A-A' AND A1-A1'

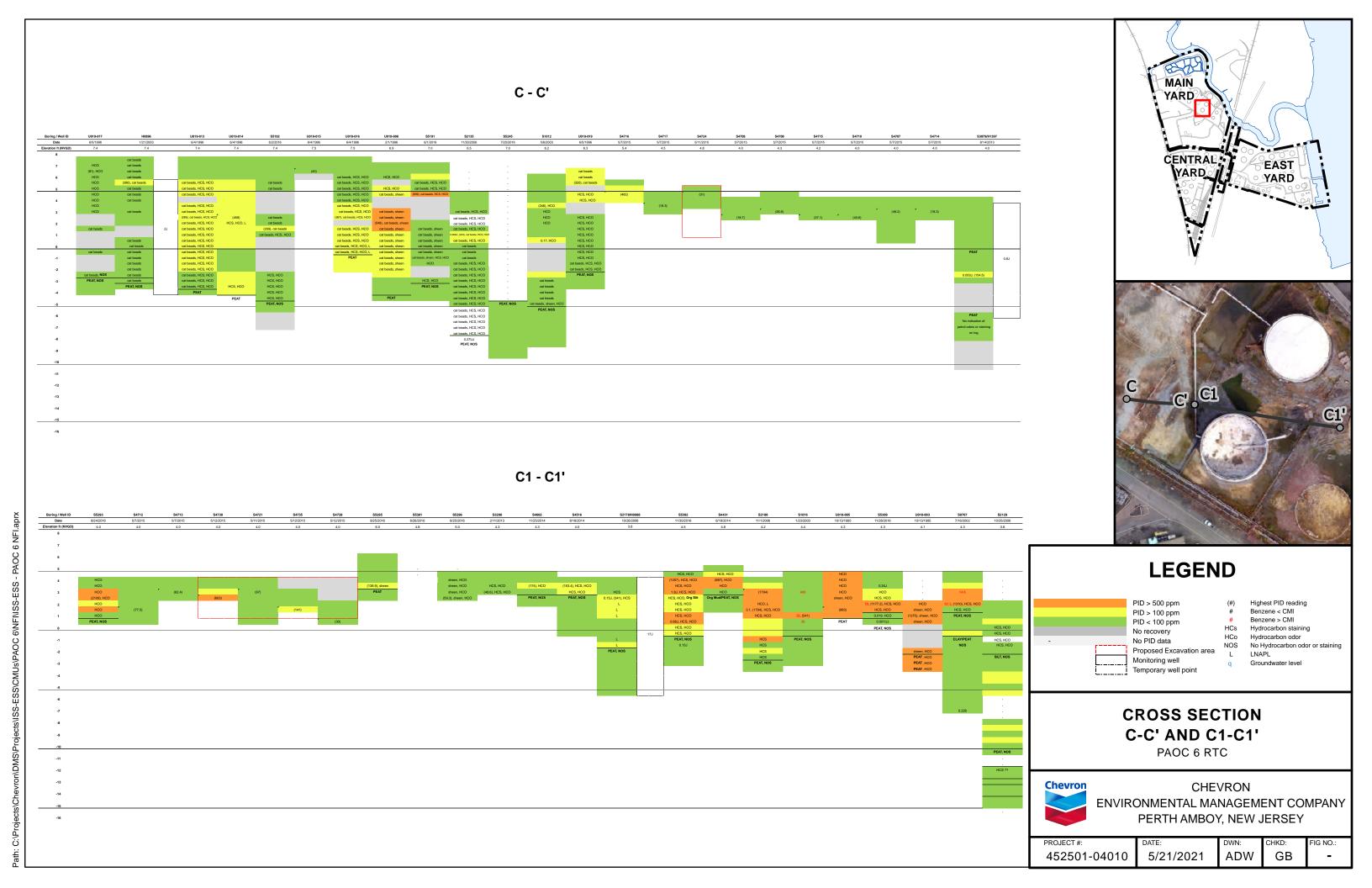
PAOC 6 RTC

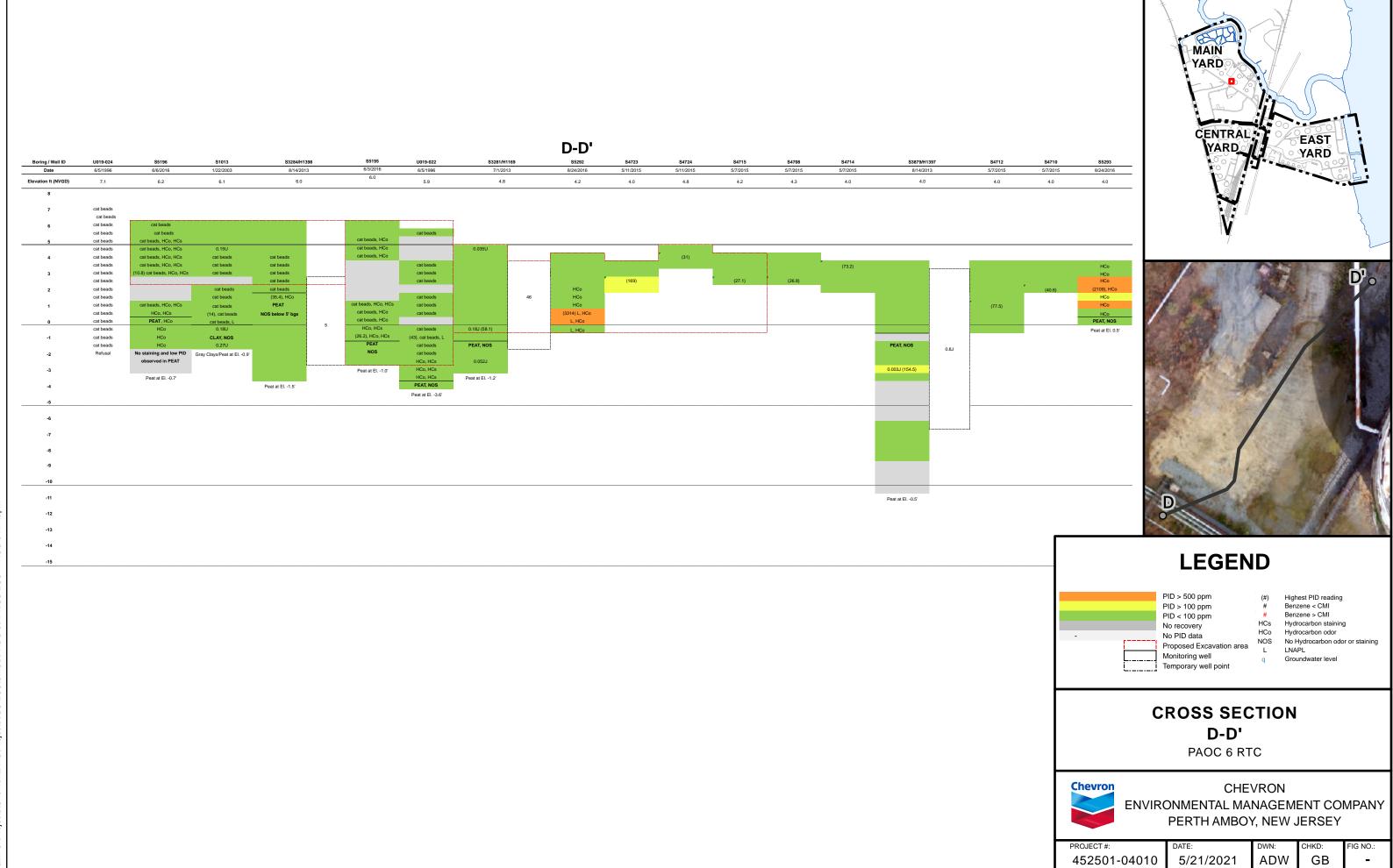


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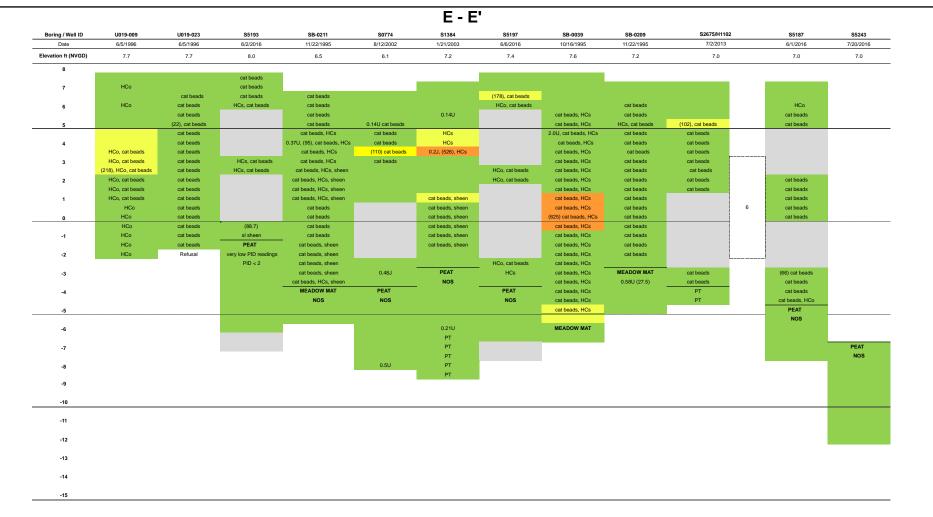
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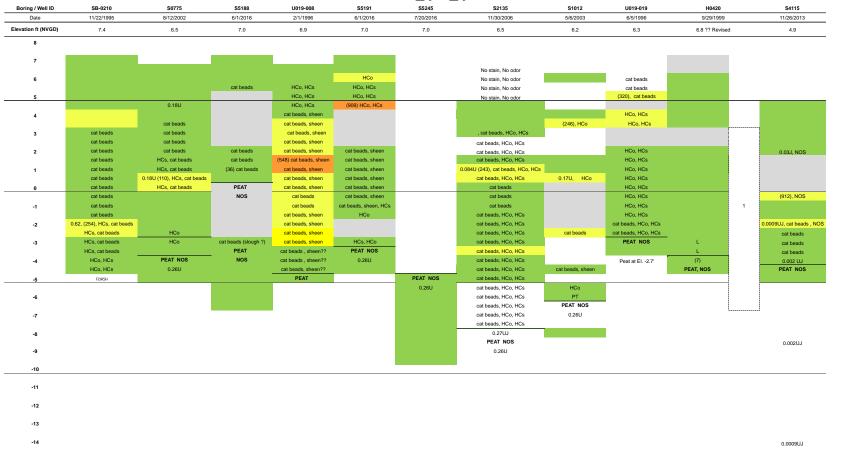




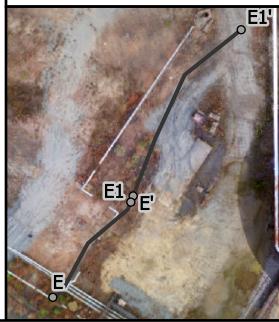
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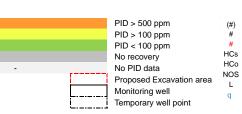












- Highest PID reading Benzene > CMI Hydrocarbon staining Hydrocarbon odor
- NOS No Hydrocarbon odor or staining LNAPL

CROSS SECTION E-E'

PAOC 6 RTC



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